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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/564,760	07/07/2006	Arik Hasson	24024-513 NATL	1762

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EXAMINER	
BARNHART, LORA ELIZABETH	
ART UNIT	**PAPER NUMBER**
1651	

MAIL DATE	DELIVERY MODE
09/09/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/564,760	HASSON ET AL.	
	Examiner	Art Unit	
	Lora E. Barnhart	1651	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *1* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-52* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *1-52* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claims 1-52 as recited in the claim listing accompanying the 1/17/06 preliminary amendment (which appears to be identical to the originally filed claim listing) are currently pending.

Election/Restrictions

Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claim(s) 1-23 and 50-52, drawn to a method of enhancing function of an endodermally derived organ comprising culturing stem cells under particular conditions such that differentiation is inhibited and implanting said cells into said organ.

Group II, claim(s) 24-41, 47, and 48, drawn to a method of expanding and transdifferentiating a population of non-endodermally derived stem cells into endodermal cells.

Group III, claim(s) 42-46, drawn to a population of cells that have been transdifferentiated.

Group IV, claim(s) 49, drawn to endocrine hormones.

The inventions listed as Groups I-IV do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: They are not unified by a special technical feature.

An international or a national stage application containing claims to different categories of invention will be considered to have unity of invention if the claims are drawn only to one of the following combinations of categories: (1) a product and a process specially adapted for the manufacture of said product; (2) a product and a process of use of said product; (3) a product, a process specially adapted for the manufacture of the said product, and a use of the said product; (4) a process and an apparatus or means

specifically designed for carrying out the said process; or (5) a product, a process specially adapted for the manufacture of the said product, and an apparatus or means specifically designed for carrying out the said process. **If multiple products, processes of manufacture or uses are claimed, the first invention of the category first mentioned in the claims of the application and the first recited invention of each of the other categories related thereto will be considered as the main invention in the claims.** See 37 C.F.R. 1.475.

In this case, the first named invention is the method of Group I, i.e. a method of using stem cells that have not differentiated to enhance organ function. The products of Groups III and IV are not used or produced by the method of Group I, so they have been placed into separate Groups. There is no provision in the PCT rules for placing two distinct methods together, and since Groups I and II use and produce different products, they are distinct. Group I requires maintaining stem cells in an undifferentiated state, while Group II specifically requires transdifferentiating stem cells.

This application contains claims directed to more than one species of the generic invention. These species are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1.

The species are as follows:

Culture conditions: (a) conditions reducing expression and/or activity of CD38 in said cells, (b) conditions reducing capacity of said cells in responding to signaling pathways involving CD38 in said cells, (c) conditions reducing capacity of said cells in responding to retinoic acid, retinoids and/or Vitamin D in said cells, (d) conditions reducing capacity of said cells in responding to signaling pathways involving the retinoic acid receptor, the retinoid X receptor and/or the Vitamin D receptor in said cells, (e) conditions reducing capacity of said cells in responding to signaling pathways involving PI 3-kinase, (f) conditions wherein said cells are cultured in the presence of nicotinamide, a nicotinamide analog, a nicotinamide or a nicotinamide analog derivative or a nicotinamide or a nicotinamide analog metabolite, (g) conditions wherein said cells are cultured in the presence of a copper chelator, (h) conditions wherein said cells are cultured in the presence of a copper chelate, and (i) conditions wherein said cells are cultured in the presence of a PI 3-kinase inhibitor, as in claims 1 and 24; elect ONE if Group I or II is elected.

Cells: (j) hematopoietic cells, (k) umbilical cord blood cells, (l) G-CSF mobilized peripheral blood cells, (m) bone marrow cells, (n) hepatic cells, (o) pancreatic cells, (p) neural cells, (q) oligodendrocyte cells, (r) skin cells, (s) gut cells, (t) embryonal stem cells, (u) muscle cells, (v) bone cells, (w) mesenchymal cells, (x) chondrocytes and (y) stroma cells, as in claims 3 and 25; elect ONE if Group I or II is elected.

Growth factors: (z) FGF-1, (a') FGF-2, (b') LIF, (c') OSM, (d') HGM, (e') FBS, (f') HGF, (g') EGF, and (h') SCF, as in claims 5 and 27; elect ONE if Group I or II is elected.

Selection criteria: (i') expression of CD34 and (j') expression of CD133, as in claims 8, 10, 12, 29, 31, and 33; elect ONE if Group I or II is elected. Claims 7, 9, 11, 28, 30, and 32 will be examined to the extent they are commensurate in scope with this election.

Organs: (k') liver, (l') intestine, and (m') pancreas, as in claim 13; elect ONE if Group I is elected.

Early acting cytokines: (n') stem cell factor, (o') FLT3 ligand, (p') interleukin-6, (q') thrombopoietin, and (r') interleukin-3, as in claims 16 and 36; elect ONE if Group I or II is elected.

Late acting cytokines: (s') granulocyte colony stimulating factor, (t') granulocyte/macrophage colony stimulating factor, and (u') erythropoietin, as in claims 17, 18, 37, and 38; elect ONE if Group I or II is elected.

Genetic status of cells; (v') not carrying any exogenous DNA and (w') modified with exogenous DNA, as in claims 20 and 39; elect ONE if Group I or II is elected.

Inhibitors of PI 3-kinase: (x') wortmannin and (y') LY294002, as in claim 22; elect ONE if Group I is elected.

Endodermal cell markers: (z') insulin, (a'') glucagon, (b'') somatostatin, (c'') pancreatic polypeptide, (d'') Pdx-1, (e'') pancreatic enzymes, (f'') C-peptide, (g'') albumin, (h'') CK18, (i'') CK 19, (j'') HNF, (k'') THY-1 receptor, (l'') c-Met receptor, and (m'') c-kit, as in claim 40; elect ONE if Group II is elected.

Endocrine hormones: (n'') insulin, (o'') glucagon, and (p'') somatostatin, as in claim 48; elect ONE if Group II is elected.

Disorders: (q'') primary biliary cirrhosis, (r'') hepatic cancer, (s'') primary sclerosing cholangitis, (t'') autoimmune chronic hepatitis, (u'') alcoholic liver disease, (v'') infectious hepatitis, (w'') parasitic hepatic disease, (x'') steatohepatitis, (y'') hepatic toxicity, (z'') acute pancreatitis, (a''') chronic pancreatitis, (b''') hereditary pancreatitis, (c''') pancreatic cancer, and (d''') diabetes, as in claims 51 and 52; elect ONE if Group I is elected. Claim 50 will be examined to the extent it is commensurate in scope with this election.

Applicant is required, in reply to this action, to elect a single species to which the claims shall be restricted if no generic claim is finally held to be allowable. The reply must also identify the claims readable on the elected species, including any claims subsequently added. An argument that a claim is allowable or that all claims are generic is considered non-responsive unless accompanied by an election.

Upon the allowance of a generic claim, applicant will be entitled to consideration of claims to additional species which are written in dependent form or otherwise include all the limitations of an allowed generic claim as provided by 37 CFR 1.141. If claims are added after the election, applicant must indicate which are readable upon the elected species. MPEP § 809.02(a).

The following claim(s) are generic: 2, 4, 5, 14, 15, 19, 21, 23, 26, 34, 35, 41-47, and 49.

The species listed above do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, the species lack the same or corresponding special technical features for the following reasons: Pursuant to PCT Rule 13.2 and PCT Administrative Instructions, Annex B, Part 1(f)(I)(B)(2), the species are not art-recognized equivalents. When alternatives of chemical compounds are claimed, they shall be regarded as being of a similar nature where all alternatives have a common property or activity, and either a significant structural element is shared by all of the alternatives, or all of the alternatives belong to a recognized class of chemical compounds in the art to which the invention pertains. The words "significant structural element is shared by all of the alternatives" refer to cases where the compounds share a common chemical structure which occupies a large portion of their structures, or in case the compounds have in common only a small portion of their structures, the commonly shared structure constitutes a structurally distinctive portion in view of existing prior art, and the common structure is essential to the common property or activity. The structural element may be a single component or a combination of individual components linked together. The words "recognized class of chemical compounds" mean that there is an expectation from the knowledge in the art that members of the class will behave in the same way in the context of the claimed invention. In other words, each member could be substituted one for the other, with the expectation that the same intended result would be achieved. The species in each of the above genera include cell types that are not equivalent to each other; proteins that differ in amino acid sequence and function; conditions that do not appear to comprise

equivalent components; and disorders that do not share common symptoms, mechanisms, or treatments, inter alia.

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a species or invention to be examined even though the requirement may be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected invention.

The election of an invention or species may be made with or without traverse. To preserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse.

Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lora E. Barnhart whose telephone number is (571)272-1928. The examiner can normally be reached on Monday-Thursday, 9:00am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael G. Wityshyn can be reached on 571-272-0926. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Lora E Barnhart/
Primary Examiner, Art Unit 1651